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UNITED STATES DEPARTMENT OF AGRICULTURE  
Bureau of Entomology and Plant Quarantine

DDT SPRAY FORMULATIONS FOR CONTROL OF THE BARK BEETLE VECTORS  
OF THE DUTCH ELM DISEASE

The smaller European elm bark beetle and the native elm bark beetle are proven carriers of the Dutch elm disease fungus. The control of this disease is dependent on the control of these bark beetles.

Spray formulations containing DDT have been found experimentally to be very effective in controlling elm bark beetles. It is believed that they may be found to be equally effective under average field conditions.

The following formulations have been found effective for use on living elm trees to prevent feeding by adult bark beetles:

- A. Technical DDT, 16 pounds  
Industrial grade benzene,  $2\frac{1}{4}$  gallons  
Velsicol AR-50, 1 gallon  
Triton X-100, 1 pint
- B. Technical DDT, 16 pounds  
Industrial grade benzene,  $2\frac{1}{4}$  gallons  
Sun Aro-sol 151-B, 1 gallon  
Triton X-100, 1 pint
- C. Technical DDT, 16 pounds  
Industrial grade benzene,  $1\frac{1}{2}$  gallons  
Industrial grade xylene,  $1\frac{1}{2}$  gallons  
Sun Aro-sol 151-B,  $1/2$  gallon  
Triton X-100, 1 pint

To prepare these concentrates, first mix the solvents, then dissolve the DDT and finally mix in the Triton X-100.

Caution should be exercised in handling the solvents as they are inflammable and concentrations of the fumes may be toxic. Care should be used in handling the concentrated mixtures so that they do not contact the skin for prolonged periods. Wash any exposed skin surface with soap and water soon after exposure.

All the above formulations are for concentrates that when diluted with water will form emulsions. These concentrates are stable if stored in sealed containers at room temperatures. For application to trees the indicated amount of the concentrate should be added to 100 gallons of water.

The recommended schedule for applying the above sprays is as follows: First application at 16 pounds of DDT per 100 gallons of spray to be applied just before the leaves become large enough to interfere with good spray coverage of the bark surface of the twigs and small branches. The

second application should be made from 2½ to 3 months later, using DDT at the rate of 8 pounds per 100 gallons.

It is advisable in applying these sprays to living elm trees to use as finely an atomized spray cloud as possible. This will produce a good coating on the bark surface of the twigs and small branches and at the same time hasten the volatilization of the solvents thus reducing the chances of burning the foliage. It is estimated that 15 gallons of spray should adequately cover the average 50-foot elm tree. Excessive dripping of these sprays on to shrubbery, such as Japanese maple, may cause foliage injury to such plantings.

It is essential in applying these sprays that the entire bark surface be completely covered, especially on the twigs and small branches.

#### Spray for Elm Wood

Technical DDT dissolved in No. 2 fuel oil at 8 pounds per 100 gallons makes an effective spray for use on elm wood that is infested or likely to be infested to destroy or prevent the development of bark beetle larval broods. One thorough application will remain effective for an entire season. This spray should be applied so as to wet the entire bark surface; usually 2 ounces of spray per square foot of bark surface will suffice.

#### Materials

Industrial grades of benzene and xylene are available from most coal tar distillation plants.

Velsicol AR-50 is produced by the Velsicol Corporation, 120 East Pearson Street, Chicago, Ill.

Sun Aro-sol 151-B is produced by the Sun Oil Co., 1608 Walnut Street, Philadelphia 3, Pennsylvania.

Triton X-100 is produced by Rohm & Haas Co., Washington Square, Philadelphia, Pennsylvania.

There are several commercially prepared DDT emulsion concentrates on the market. These concentrates contain DDT, solvent and emulsifier and are ready for diluting with water. None of these mixtures have been tested by us against elm bark beetles and hence no recommendations can be made on their use.





